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AGRICULTURAL MEMORANDUM NO 568

LOSSES OF PIGS IN TRANSIT - EFFECT OF HUMIDITY

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The relation between losses in transit and mean day temperature over a 12-year period has been shown in Ag Mem 565. The data referred to in this paper were further analysed to determine whether losses were also affected by humidity. The 1200h dew points, measured at Kew were meaned for days when deaths in transit occurred, for days when no such deaths were reported and for days without deaths, either in transit or pens, within the same mean day temperature range (T° - T + 0.9°C). Above 19°C occasions when deaths in transit did not occur were too few to allow any accurate comparison of the mean dew points (Td) for days with and without deaths. Thus the analysis was not continued above this temperature.

The effect of humidity on pig deaths on arrival only, was investigated. Deaths in pens could not be assumed as a direct consequence of the travelling conditions on that day, since there was evidence that the pens were not completely emptied each day.

The results are shown in the appendix (1).

A T-test applied to Td means, for days with and without deaths in transit, between which there was an apparently real difference ie 11°C (January–July period) 9°C (August–December), showed this difference to be significant. This suggests that low humidity increases the probability of death, which is in general supported by the results for temperatures below this level. Possibly greater evaporation from the body surface, causing greater cooling, increases the cold stress at low temperatures. However, the inconsistency of the results provides no evidence for a firm relation between greater losses and low or high humidity. If humidity has any effect, it appears to be less important at higher temperatures, possibly because at such temperatures the pigs create a local environment of 100% humidity, little influenced by the external level.

Such inconsistency is shown in a further investigation.

For temperatures above 15°C, a more exact analysis of the number of pig deaths per thousand transported was carried out. For each 1°C temperature range, the number of deaths on arrival and total transported were summed with respect to the 1200h dew points. The results obtained were grouped in overlapping triplets of temperature. These "smoothed" results are shown in appendix (2).

These results again show no consistent trend, suggesting that there is no strong influence of external humidity. There is some indication of a negative correlation, ie more deaths on days of low humidity, though this appears improbable at such temperatures, unless partial dehydration occurs.

In all cases it must be remembered that the ventilation of the truck is unknown and local conditions of high humidity are likely to build up inside the vehicle.

Any comments or suggestions on this paper should be referred to the author.

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Meteorological Office
Bracknell

APPENDIX (1)

TEMP °C	JAN-JULY 1961-72 Occasions: Death in transit	No death in transit	No deaths	Mean Td: Death in transit	No death in transit	No deaths
- 4	1	2	2	- 9.0	- 6.5	- 6.5
- 3	2	5	4	- 7.5	- 5.0	- 5.0
- 2	3	6	3	- 4.0	- 5.7	- 5.7
- 1	7	13	10	- 3.1	- 4.9	- 5.3
0	11	21	16	- 3.9	- 3.1	- 2.9
1	19	33	21	- 2.4	- 3.0	- 2.8
2	15	43	26	- 2.0	- 2.0	- 1.7
3	31	42	22	- 1.5	- 1.0	- 0.9
4	36	71	46	- 0.4	- 0.1	- 0.1
5	41	70	44	1.0	1.5	1.2
6	31	73	44	1.7	1.8	1.5
7	40	70	42	3.0	2.7	2.3
8	53	94	67	3.9	3.5	3.6
9	54	79	55	4.2	4.8	4.6
10	53	71	46	5.3	5.5	5.5
11	49	76	51	5.5	6.0	6.2
12	53	61	39	6.3	6.2	6.3
13	54	63	33	7.0	6.9	6.6
14	54	57	32	8.0	7.9	8.0
15	58	48	33	8.5	8.5	8.5
16	79	44	32	9.8	10.0	10.2
17	72	37	22	10.9	10.7	10.7
18	56	31	18	11.5	11.8	12.1
19	43	24	17	12.4	12.9	13.5

TEMP °C	AUG-DEC 1961-72 Occasions: Death in transit	No death in transit	No deaths	Mean Td: Death in transit	No death in transit	No deaths
- 2	1	3	1	- 2.0	- 4.3	- 3.0
- 1	2	5	4	- 5.0	- 2.8	- 3.5
0	-	16	11	-	- 2.3	- 2.1
1	7	17	9	- 3.0	- 2.3	- 2.3
2	6	26	17	- 1.0	- 1.0	- 0.9
3	12	22	16	1.2	1.0	1.1
4	17	35	26	1.1	1.5	1.2
5	16	36	23	2.5	2.4	2.3
6	24	37	23	2.9	3.5	3.6
7	30	62	37	4.6	3.5	3.7
8	33	41	26	4.7	4.8	4.8
9	29	40	25	4.7	6.3	6.3
10	31	44	30	7.2	7.1	6.6
11	24	51	32	6.5	8.3	8.3
12	51	50	27	7.9	7.5	7.5
13	56	47	33	9.3	9.4	9.6
14	52	70	41	9.7	9.6	9.6
15	68	67	42	10.9	11.1	11.2
16	77	50	36	11.8	11.6	11.4
17	61	45	29	12.3	11.8	12.2
18	43	32	14	12.9	13.0	13.6
19	32	18	12	19.6	12.3	12.8

APPENDIX (2)

Dew Point TEMP	Number of pigs dead on arrival per 1000 pigs transported							
	15–17°C	16–18°C	17–19°C	18–20°C	19–21°C	20–22°C	21–23°C	22–24°C
– 1	0.76							
0	3.95							
1								
2								
3	0.55							
4	1.01	1.66						
5	0.97	1.22	1.53	2.78				
6	0.31	0.39	0.53	2.47				
7	0.72	0.80	0.64	0.33	0.45	0.45		
8	0.67	0.83	1.02	1.40	1.84	1.84		
9	0.88	0.95	1.10	0.95	0.63			
10	0.91	0.87	0.84	0.80	1.13	0.90	0.63	
11	0.60	1.04	1.24	1.67	1.04	0.58	0.69	
12	0.98	1.11	1.46	1.56	1.64	1.46	0.57	
13	0.65	0.70	0.66	1.16	1.75	2.26	2.56	
14	0.56	0.67	0.79	0.90	0.95	1.09	1.27	1.71
15	0.81	0.81	0.91	0.96	1.42	1.12	1.95	2.01
16	0.20	0.28	0.43	1.12	1.30	1.19	1.17	2.78
17			1.54	1.10	1.41	1.78	1.82	2.12
18					0.44	0.32	0.56	0.64
19				0.60	0.60	0.60		
Correlation coefficient	–0.56	–0.54	–0.02	–0.53	+0.19	–0.10	+0.23	–0.41